Superfund Program

Proposed Plan **April 2018**
Ten-Mile Drain Site – Near-Surface Soils
St. Clair Shores, Michigan

INTRODUCTION

The purpose of this Proposed Plan is to give background information about the Ten-Mile Drain Superfund site (TMD site), describe the various cleanup alternatives considered for cleaning up polychlorinated biphenyl (PCB)-contaminated near-surface soils at residential and commercial areas, and identify U.S. Environmental Protection Agency's (EPA's) preferred cleanup alternative. This document is issued by EPA, the lead agency for site activities. EPA, in consultation with the Michigan Department of Environmental Quality (MDEQ), the support agency, will select a final remedy for the PCB-contaminated near-surface soils portion of the site after reviewing and considering all information submitted during the 30-day public comment period, which runs from ***April 23rd*** through ***May 23rd, 2018***. The selected cleanup plan, which will be announced in local newspaper notices and presented in an EPA document called a Record of Decision (ROD), could differ from this Proposed Plan depending on information or comments EPA receives during the public comment period. Therefore, the public is encouraged to review and comment on this Proposed Plan. Members of the public are also encouraged to attend and participate in an open house at St. Clair Shores Public Library, 22500 Eleven Mile Rd from *3:00pm – 5:30pm* with a public meeting to follow at City Council Chambers, 27600 Jefferson Circle Drive at 6:30 pm on ***May 10, 2018.***

EPA is proposing that **Alternative 2: Excavation and Off-Site Disposal of Contaminated Near-Surface Soils** be selected to clean up PCB-contaminated near-surface soils at residential and commercial properties related to the TMD site. EPA believes that Alternative 2 would be protective of human health and the environment, would meet federal and state applicable or relevant and appropriate requirements (ARARs), would be cost effective, and would be effective in the long term.

EPA is managing the contamination at the TMD site through a phased approach. EPA issued interim RODs in September 2011 and May 2014 which addressed the removal of source materials from the Ten Mile drain storm sewer system (TMD system). The goal of the selected interim measures was to prevent further migration of PCB contamination to the Lange and Revere Street canals until a final remedy is selected and implemented at the site. The remedy recommended by this Proposed Plan would mitigate unacceptable exposure to PCB-impacted near-surface soils on residential and commercial properties.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the September 2016 *Remedial Investigation Report* and the July 2017 *Near-Surface Soils Feasibility Study Report* and other documents contained in the Administrative

Record (AR) file for this site. EPA and MDEQ encourage the public to review these documents to gain a more comprehensive understanding of the TMD site and the Superfund activities that have been conducted at the site to date.

The public is encouraged to review the supporting documents for the Ten-Mile Drain Superfund site at the following locations:

St. Clair Shores Public Library
22500 E. 11 Mile Rd
St. Clair Shores, IL 48081
(586) 771-9020
Call for Hours

EPA Region 5 Records Center
77 W. Jackson Blvd.
Chicago, IL 60604
(312) 353-1063
Mon-Fri - 8 am to 4 pm (central time)
Call for appointment

SITE BACKGROUND

The TMD site is located northeast of the City of Detroit on the western shores of Lake St. Clair in St. Clair Shores, Macomb County, Michigan (see Figure 1). As of the 2015 Census, St. Clair Shores had a total population of 59,903. The site is located in a mixed commercial/residential area near the intersection of Bon Brae Street and Harper Avenue. The site includes a portion of the TMD system (see Figure 2), which consists of concrete storm sewer pipes and backfill material surrounding the pipes in utility corridor 15 feet below ground surface (bgs). The site is known to encompass several blocks where PCBs have been found in the TMD system in significant concentrations, as well as areas to which the historical PCB release is known to have migrated. Specifically, the historical release is known to have migrated from a commercial parking lot by surficial track-out onto adjacent properties and through the storm sewer until being discharged into the Lange and Revere Street canals connected to Lake St. Clair. There is not an ongoing release of PCBs from the commercial property to the TMD system. The Lange and Revere Street canals, which provide recreational boating access to Lake St. Clair for approximately 125 homes (see Figure 3), are private property and are used for recreational boating, swimming, and fishing.

Site History and Response Actions

Over the past sixteen years, several removal actions, interim remedial actions and associated investigations have taken place since PCBs were first discovered at the TMD site in 2001. This section of the Proposed Plan summarizes the site history with a focus on the various removal, remedial and associated site investigations related to PCB-impacted near-surface soils. Documents contained in the AR file for the site contain greater detail regarding previous actions that focused on the TMD system and the Lange and Revere Street canals.

<u>EPA Removal Program Activities (2002 to 2014)</u>

In July 2001, sediment samples were collected by the Macomb County Public Works Office (MCPW) as part of a permit application process for a proposed dredging project in the Lange and Revere Street canals. The analytical results were submitted to the U.S. Army Corps of Engineers, who then notified MDEQ based on the elevated levels of PCBs in the sediment. In December

2001, MDEQ investigated the TMD system and confirmed there was an upstream source of PCB contamination in the drain. As a result of MDEQ's investigation, MCPW sampled and confirmed the presence of PCBs in both the Lange and Revere Street canals and TMD system.

EPA's removal program initiated a time-critical removal action (TCRA) at the site in August 2002 and completed the work in July 2004. During the removal action, high concentrations of PCB-contaminated sediments were removed from inside the TMD system, along with PCB-contaminated sediments ranging from 10 parts per million (ppm) to 4,900 ppm in a portion of both the Lange and Revere Street canals and the connecting channel between these canals. All waste was transported for disposal at approved off-site facilities, and any areas damaged due to EPA's actions were restored. In total, EPA disposed of approximately 5,900 tons of PCB-contaminated materials and 18,000 tons of non-hazardous materials. An on-site water treatment plant was also constructed to treat contaminated water removed from the sediment. Supplemental investigations were conducted in parallel to the removal action activities in order to better characterize the site. EPA sampled 15 residential properties along the Lange and Revere Street canals to assess whether using water from the canals for irrigation of lawns or gardens may have caused yards to be contaminated with PCBs. For each residence sampled, five-point composite surface soil samples were collected from each different area (i.e., front yard, back yard, garden) at each property. PCBs were detected in only one composite soil sample (0.86 ppm) from a residential yard, which was below the removal program's cleanup goal for soil of 1 ppm. (*Federal On-Scene Coordinator's Report - TCRA 2002-2004, EPA 2004.*)

In 2004, MCPW conducted quarterly post-removal sampling of the TMD system. After three rounds of quarterly sampling, PCB concentrations as high as 17,000 ppm were detected in the drain. MCPW then initiated soil sampling of the backfill materials surrounding the drain to attempt to determine if a source of PCB-contaminated oil was re-contaminating the drain. Results indicated that PCBs were present in backfill surrounding the drain at levels as high as 41,000 ppm. In January 2005, MCPW collected sediment samples from inside the drain near the intersection of Harper Avenue and Bon Brae Street and detected PCBs concentrations as high as 200,000 ppm.

In May 2005, EPA's removal program and MDEQ installed 64 additional soil borings in the suspected source area to better define the extent of PCB contamination. *(April-May 2005 Site Investigation Report, Weston 2005.*) PCBs were detected in the sand and gravel backfill surrounding the TMD system pipe and appeared centered in the area near the intersection of Harper Avenue and Bon Brae Street. This investigation also revealed one surface soil sample contaminated with PCBs at approximately 800 ppm.

Based on these findings, EPA conducted another removal action from May through July 2006. The major activities during the removal action focused on seawall repairs, installing a cured-in place pipe (CIPP) lining inside a portion of the TMD system, installing monitoring wells, and excavating and restoring areas with PCB-contaminated near-surface soils. EPA obtained access at eight residential properties to excavate near-surface soils that contained total PCB concentrations above MDEQ's Part 201 Direct Contact Criterion (DCC) for residential properties of 4 ppm. Excavated soil was loaded directly into dump trucks and transported to a staging area for waste characterization analysis prior to transportation for disposal. Soil excavation from residential yards and rights-of-way occurred to a depth of 8 to 12 inches bgs,

followed by confirmation sample collection. Excavation continued deeper when confirmation sampling results indicated PCB concentrations still exceeded 4 ppm. (*St. Clair Shores PCB Site-TCRA 2006 and EPA Final Report July 9, 2007).*

The City of St. Clair Shores performed environmental sampling and in late 2009 discovered oil inside the CIPP-lined portion of the TMD system located at the Bon Brae Street and Harper Avenue intersection that contained more than 80 percent PCBs (i.e., more than 800,000 ppm). EPA and the city identified immediate and time-critical concerns for the need to eliminate the potential for PCBs to migrate down the storm sewer and threaten the Lange and Revere Street canals. In March 2010, EPA initiated another TCRA, which included the following activities: high-pressure jet-vacuuming of the storm sewer system to remove PCB oil and sediment; off-site disposal of the PCB-contaminated materials; and installation of temporary weir structures in 15 manhole locations to allow sediment collection points. In addition, EPA conducted a geophysical survey of the area, which flagged properties for follow-up soil boring investigations in suspected source areas. A total of 43 soil borings were installed at eleven properties (seven residential and four commercial). Of the 98 soil samples collected, a commercial property on the corner of Lakeland Street and Harper Avenue had two soil samples that exceeded the Toxic Substances Control Act (TSCA) limit of 50 ppm and four that exceeded MDEQ's residential DCC of 4 ppm. *(Bon Brae/Harper Site Removal Action-TCRA 2009, Weston 2010.)*

After the 2010 removal action, the City of St. Clair Shores continued to conduct environmental sampling to monitor the conditions behind the 17 weirs inside the drain. Sampling results indicated that high levels of PCB contamination continued to infiltrate into the drain and accumulate behind the weirs. To serve as a stop-gap measure until issuance of the first interim ROD for the site, EPA conducted an emergency removal action in late February 2011 to remove PCB oil from inside the drain. Absorbent snares were used to swipe and soak up the oil that had collected behind the weirs. A total of six of the 17 weir locations required cleanout and one 55-gallon drum of soiled absorbent snares was collected for disposal. Clean snares were then attached to weighted chains and left directly upgradient of selected weirs to allow any new incoming oil to collect on them and to support future sample collection and removal efforts.

During the remedial investigation (RI), EPA discovered elevated levels of PCB contamination in public rights-of-way (also known as parkways) and residential yards near the corner of Harper Avenue and Lakeland Street. Based on these soil sample results, EPA conducted a TCRA at 10 properties, including 8 parkways, 1 residential yard, and part of a commercial property, to prevent human exposure to elevated levels of PCBs in near-surface soil. The concentration of PCBs in one parkway was 3,500 ppm. The removal action began in May 2014 and was completed in July 2014 and addressed properties with soil concentrations exceeding EPA's Removal Management Level of 22 ppm. Approximately 1,504 tons of contaminated soil (1,087 tons of TSCA soil and 417 tons of non-TSCA soil) was disposed of off-site. The removal action included the following activities:

- Site perimeter air samples were collected during active excavation activities;
- Impacted properties were excavated to various depths ranging from 6 to 40 inches;
- Excavations were backfilled with clean fill or topsoil;
- Yards were regraded to original or improved grades; and
- Yards were sodded and excavated trees were replaced.

The removal action is described in detail in a document in the AR. (*Removal Letter Report for St. Clair Shores PCB Drain Removal #2-TCRA 2014, Tetra Tech 2014.*)

Remedial Program Activities

MDEQ conducted a Site Investigation in July 2008 to document and obtain sufficient data to support listing the TMD site on the National Priorities List (NPL). EPA proposed the site for the NPL in March 2010 and finalized the site on the NPL in September 2010.

In April 2011, EPA began its source area investigation fieldwork in an attempt to find the source of the high PCB concentrations that were continuing to infiltrate the TMD system. The investigation focused on the sanitary sewer, gas, and water main utility corridors that crossed the TMD system utility corridor, which potentially could provide preferential pathways for PCB contamination to migrate into the TMD pipe. Utility lines are typically set in corridors backfilled with stone and other "loose" materials through which contamination could easily migrate. The source area investigation also included additional sampling within the TMD system utility corridor.

In August 2011, EPA designed and conducted a sediment sampling project in the Lange and Revere Street canals. Approximately 100 samples collected from the surface of the sediments and 40 samples collected from deeper sediments were analyzed for PCBs by an EPA mobile laboratory to characterize the contamination in the canals and provide information to explain the elevated PCB levels found in fish caught in the canals. Based on the findings of the 2011 sediment sampling event, the highest PCB concentrations were found near the TMD system outfall and ranged from 100 ppm to 570 ppm. The PCB concentrations decreased with depth and distance from the outfall.

In September 2011, EPA issued the first interim ROD for the TMD site to address the high concentrations of PCB-contaminated oil and sediments that continued to accumulate behind the weirs inside the TMD system. This interim action consists of monthly monitoring and removal of materials from behind the weirs, and is intended to mitigate additional PCB contamination from reaching the nearby canals until a final cleanup plan is selected and implemented for the site. These interim source control activities are ongoing and will continue for as long as necessary until a final remedial action for the site is selected and implemented.

EPA finalized its Source Area Investigation Report in January 2012. The results of the extensive investigation found significant concentrations of PCB-contaminated oil within the TMD system utility corridor backfill materials adjacent to four vaulted manhole locations: J01, M7179, M4335, and M7183. Importantly, only very low PCB concentrations were found in the backfill materials of the other utility corridors, ruling out the sanitary sewer, gas, and water main utility corridors as a source or conduit for the high PCB concentrations found at the TMD site. Additionally, PCBs were found in all depth intervals of the backfill materials near the intersection of Bon Brae Street and Harper Avenue, between Bon Brae and Lakeland Streets.

Based on the information obtained during the source area investigation, EPA issued the second interim ROD for the TMD site in May 2014. This interim remedial action addressed the PCB contamination in the bedding and backfill materials at the base of two vaulted manholes –

M7179 and J01 – in the TMD system. The second interim action included the excavation, removal, and replacement of M7179 and J01 and the surrounding impacted backfill materials, proper off-site disposal of contaminated materials, installation of monitoring and recovery wells adjacent to the newly installed manhole vaults, and institutional controls (ICs) to prevent actions that could compromise the remedy. The remedy components selected in the 2014 interim ROD were intended to address the highly-impacted backfill and bedding materials at the two manholes that EPA believed were serving as a continued source of PCBs to the rest of the TMD system and the Lange and Revere Street canals.

EPA implemented the second interim remedial action from June through December 2015, and conducted site restoration activities in May and June 2016. The TMD system was dewatered during implementation of the interim remedy, and at the end of the construction work a total 2,241.57 tons of TSCA soil and 36,000 gallons of TSCA water had been removed from the system and transported off site for disposal. During the removal of the vaulted manhole at location M7179, PCB-containing oil was observed flowing from the storm sewer pipe – specifically from the space between the pipe and the CIPP liner – into the M7179 excavation area. This prompted EPA to expand the remedial action to include the removal and replacement of the entire 120-foot length of pipe beneath Harper Avenue between the two manhole vaults, to remove any additional PCB-contaminated oil contained within and beneath that length of pipe. EPA documented this change and others in a 2016 Explanation of Significant Differences (ESD).

Both interim remedial actions were intended to serve as source control measures to reduce infiltration of PCB-contaminated oil and contaminated utility trench water into the TMD storm sewer pipe, thereby preventing high concentrations of PCBs from moving through the TMD system to the canals. Periodic removal of PCB contamination from inside the TMD system continues to achieve the RAO of mitigating the discharge of PCB contamination into the canals and the environment and preventing further environmental degradation. The removal and replacement of the bedding and backfill materials at locations M7179 and J01, along with the length of pipe between those two manholes, permanently removed from the TMD system the most highly-contaminated source materials that had been found during the RI.

In August 2015, additional RI sampling was conducted focusing on the former Martin Drain (also known as the Old Martin Drain). The Martin Drain was an open, above-ground storm water drain. Historical Macomb County drain maps indicate that the former Martin Drain had flowed through the investigation area (see Figure 4) and discharged at the Rio Vista Canal located approximately three-quarters of a mile northeast of the Lange and Revere Street canals. Based on historical information, it appears that the former Martin Drain was backfilled after the TMD storm sewer was constructed in the mid-1960s. The objective of the sampling was to determine if the former Martin Drain was previously a migration pathway for PCB contamination. EPA completed approximately 34 borings within the former Martin Drain pathway on Bon Brae Street, B Street, and Jefferson Avenue. A total of 72 samples were analyzed for PCBs. Nineteen of the 34 cores sampled contained no detectable concentrations of PCBs. Out of the remaining cores, the majority were below 3.5 ppm, with one sample result above 50 ppm. Based on the overall sample results, EPA determined that the former Martin Drain was likely a limited historical pathway for PCB migration.

It is important to note that, in addition to the data collected during the RI, near-surface soil data were collected during previous removal actions and investigations, a majority of which were discrete soil borings. The following is a list of documents containing near-surface soil data that were used to help delineate the nature and extent of near-surface soil contamination. The data in these reports were carried forward and addressed in the *Near-Surface Soils FS Report*.

- Federal On-Scene Coordinator's Report - TCRA 2002-2004 (EPA 2004);
- April-May 2005 Site Investigation Report (Weston 2005);
- St. Clair Shores PCB Site – TCRA 2006 (Weston 2007) and EPA Final Report July, 9 2007;
- Bon Brae/Harper Site Removal Action - TCRA 2009 (Weston 2010);
- 2011 Source Area Investigation (CH2M 2011); and
- Removal Letter Report for St. Clair Shores PCB Drain Removal #2 – TCRA 2014 (Tetra Tech 2014).

Enforcement Activities

EPA has not identified a potentially responsible party (PRP) linked to the PCB contamination at the site, but continues to follow all leads that arise. Between 2002 and 2005, EPA conducted a civil investigation jointly with the Federal Bureau of Investigation and the Macomb County Sheriff's Department. The investigation included comprehensive door-to-door interviews of businesses and residences in the area. In addition, city and county building and zoning records were analyzed for any mention of a business entity that might have used PCBs in or near the contaminated area. Neither effort produced any evidence linking a PRP to the PCB contamination.

As part of its PRP search activities, EPA sent an information request letter to DTE Energy (DTE) in October 2003. EPA sent a follow-up information request letter to DTE in May 2011. Based on DTE's responses, along with the results of the 2011 source area investigation which focused on a DTE transformer station just north of the intersection of Bon Brae Street and Harper Avenue, EPA has ruled out DTE property as the location of the release into the TMD system.

Based on the results of the source area investigation and other RI activities, EPA determined that the commercial property previously mentioned, located near the intersection of Harper Avenue and Lakeland Street, was the likely area where the historical PCB release occurred. EPA performed a title search to determine which commercial businesses operated there from 1940 to the present. The following is a summary of the companies that operated or owned the commercial property:

- In the 1940s, C&G Electrical Maintenance Services owned and operated the property.
- From 1973 to 1983, Henry's Cleaners was located on a portion of property.
- In the 1970s, the property was also operated by Algo Tool Co. (Algo) and G&D Tool & Automation Company, Inc., known as G&D Tool, which produced specialty dies and tools, die sets, jigs and fixtures, and industrial molds. Algo was incorporated in Michigan in October 1965 and dissolved in March 1980. The owners of Algo are both deceased.

- From 1989 to 2009, J.M Olson and Trustees, a construction and development company, owned the commercial property and also used the building on that property as office space.
- Since 2009, the commercial property is owned by Triangle Development Services, LLC (TDS) and currently occupied by a multi-tenant medical building.

In 2014, EPA sent information request letters to Algo and G&D Tool's former owner, employees, president and program manager inquiring about the use of PCBs at this property. In 2017, EPA sent information request letters to J.M. Olson and TDS, the most recent commercial property owners, inquiring about business operations, building and parking lot renovations, and any historic PCB release(s). None of the responses provided information about leaks, spills, mishandling of materials or the use or presence of PCBs at the property.

SITE CHARACTERISTICS

This section of the Proposed Plan summarizes the current information available about site characteristics with an emphasis on near-surface soils. A Human Health Risk Assessment (HHRA) and a Screening-Level Ecological Risk Assessment (SLERA) were conducted as part of the RI. These investigations identified PCBs as the contaminant of concern (COC) that poses potential risks to human health and environment. The significant findings and conclusions from the site characterization activities completed during the RI are summarized below, and additional details are provided in the Final RI Report.

Contaminants of Concern

PCBs are the COC in soil and sediment at the site. PCBs are a group of fabricated chemicals originally used in industrial processes and products such as coolants and lubricants. In 1977, PCB production was banned in the United States, but PCB mixtures remain in old electrical equipment and other items, and there is also substantial PCB contamination in landfills and rivers. EPA considers PCBs as possible cancer-causing chemicals. PCBs can pose potential health risks through eating contaminated food, direct contact with soil or water, or breathing PCB-contaminated air or airborne particles. One of the main exposure pathways of concern at sites with PCB contamination in sediments is human ingestion of PCB-contaminated fish.

Residential and Commercial Near-Surface Soils

The near-surface soils investigation areas, known as Investigation Areas 1 and 2 as displayed on Figure 4, were based on the results of soil samples collected during the RI as well as soil samples collected during previous removal actions and investigation activities. The residential and commercial near-surface soils investigation areas include properties surrounding the commercial property at the corner of Harper Avenue and Lakeland Street as well as properties located along the Lange and Revere Street canals.

Near-Surface Soils

The TMD site is located in an area classified by the Natural Resources Conservation Service (NRCS) as containing approximately 85 percent (by area) Lenawee clay, 10 percent Toledo silty clay loam, and 5 percent Del Ray loam soils. These soils are typical of clayey glaciolacustrine deposits that formed on flats of till-floored lake planes. Soil samples collected during the RI from surface to 5 feet bgs were typically characterized as topsoil (0 to 6 inches bgs) and dense clay underlying the topsoil to 5 feet bgs, consistent with the NRCS classifications. The native soils of the site are characterized as having very low transmissivity rates. No water-bearing seams have been identified at the site from 0 to 20 feet bgs.

Surface Water Hydrology

Based on the 2011 source area investigation and other RI results, no groundwater aquifer is present within 20 feet of the ground surface at the site. The site is located within the Lake St. Clair watershed. Historical Macomb County drain maps indicate that the former Martin Drain had formerly flowed through Investigation Area 1 (see Figures 4 and 5) and discharged at the Rio Vista Canal located northeast of the site. Based on historical information, it appears that the Martin Drain was backfilled after the TMD system was constructed in the mid-1960s. There is minimal topographical relief at the site. Residential and commercial properties near the site are contoured to direct storm water runoff towards the street or parking lots where the storm water enters catch basins that connect to the TMD system. Water entering the TMD system discharges into the Lange and Revere Street canals and subsequently into Lake St. Clair.

Nature and Extent of PCB Contamination

PCBs are the only COC associated with the TMD site. For nature and extent purposes, the MDEQ human health risk-based DCC of 4 ppm for residential properties and 16 ppm for commercial properties were used as the screening levels during the RI. MDEQ has indicated that the Part 201 cleanup criteria are in the process of being revised, and that it is likely the new residential and commercial DCC will be 1.9 ppm and 20 ppm, respectively. It is not currently known when the MDEQ Part 201 changes may occur. Given this uncertainty, EPA decided to use more conservative screening criteria: EPA used 1 ppm for residential properties and 10 ppm for non-residential (i.e., commercial) properties, based on TSCA cleanup levels found at 40 CFR 761.61(a)(4), for screening purposes. Additionally, EPA used a screening criterion of 10 ppm for soils within utility trenches that might be encountered by utility workers.

Decision Units[1] *and Geostatistical Sampling*

During the RI, EPA divided properties being investigated into different "decision units," such as a front yard, back yard, or parkway. EPA conducted geostatistical sampling by advancing a minimum of eight borings in each decision unit. Larger decision units had more than eight borings advanced, with the number of borings based on the size of the decision unit.

[1] In the 2017 *Near-Surface Soils Feasibility Study,* the term "Exposure Unit" was used in the discussion of the geostastical sampling method. This Proposed Plan and the upcoming ROD will use the term "Decision Unit" instead of "Exposure Unit."

Geostatistical sampling treats a specific decision unit as an individual area, and the concentration is based on a representative value for that decision unit, not an individual sample point.

The soil borings were advanced to a maximum depth of 3 feet bgs. Soil was collected from each boring at the following intervals:

- 0 to 0.5 foot bgs;
- 0.5 to 1 foot bgs;
- 1.0 to 1.5 feet bgs;
- 1.5 to 2.0 feet bgs;
- 2.0 to 2.5 feet bgs; and
- 2.5 to 3.0 feet bgs.

Soil samples within a decision unit were homogenized into a composite sample for each interval. EPA's mobile laboratory conducted the PCB analytical work out in the field. Initially, the laboratory analyzed the samples for the 0 to 0.5 foot bgs, 1.0 to 1.5 feet bgs, and 2.5 to 3.0 feet bgs intervals. If the analytical results were above 2 ppm for an analyzed interval, then the next deepest interval was submitted to the laboratory for analysis.

During the RI, 84 residential decision units were geostatistically sampled. Forty-one of the residential decision units had PCB concentrations above the 1 ppm screening criterion. The 2014 TCRA remediated 10 properties that had soil concentrations exceeding 22 ppm, including 8 residential parkways, one residential property, and part of a commercial property. In light of that TCRA, currently 32 known residential decision units (i.e., front yard, back yard, and/or parkway) have PCB concentrations exceeding 1 ppm in the near-surface soils. Table 1 summarizes this information.

TABLE 1: Current Residential Decision Units with Total PCB Concentrations Exceeding 1 ppm

Residential Investigation Areas	Decision Units Sampled	Decision Units Exceeding 1 ppm	Highest Concentration (ppm)
Parkway	21	10	14
Front Yard	30	11	8.0
Back Yard	33	11	9.4
Total Decision Units	84	32	
Total Properties*	57	25	

*A property may include more than 1 decision unit.

Based on the geostatistical sampling results, key conclusions regarding the nature and extent of contamination for near-surface soils are summarized as follows:

- The PCB concentrations in near-surface soils along Lakeland Street, Harper Avenue, and Bon Brae Street generally decrease with distance from the commercial property at the corner of Harper Avenue and Lakeland Street.

- The PCB concentrations in the Lange and Revere Street canal sediments generally decrease with distance from the TMD outfall. However, the PCB concentrations in the yards along the canals are more randomly distributed. It is unknown whether or to what extent the property owners' use of canal water (for watering yards and/or gardens or for other activities) has contributed to soil contamination in residential yards.
- PCB concentrations generally decrease with depth at both residential and commercial properties. The highest concentrations are typically found within 2.5 feet bgs. The bullet points below discuss the 41 residential decision units that were found during the RI (i.e., pre-2014 TCRA) to have PCB concentrations above 1 ppm.
    - At 33 of the 41 decision units, the highest PCB concentrations were located in the 0-to-0.5-foot interval.
    - PCB concentrations were vertically delineated to less than 1 ppm within 2.5 feet bgs at 31 of the 41 decision units. Additional delineation is necessary at 9 other decision units. (One of the 41 decision units was addressed during the 2014 TCRA.)

Discrete Samples

All discrete soil samples collected during previous investigations that had results exceeding current screening levels (1 ppm for residential properties, 10 ppm for non-residential properties and utility trench soils) will require pre-design geostatistical sampling to confirm that the decision unit (and not just a discreet sample) exceeds the soil cleanup level(s) ultimately selected in the ROD. Discrete soil samples were collected on residential and commercial properties, as well as in the TMD, sanitary, and water main utility corridors. It is important to note that the water main lines on Bon Brae Street and Lakeland Street run along the parkway in front of residential and commercial properties.

Eighteen properties (17 residential and 1 commercial) had discreet sample results exceeding current screening levels during previous investigations and therefore require predesign sampling. Discrete sample results on the residential properties ranged from 1.1 ppm to 169 ppm. Discrete sample results on the commercial property ranged from 45 ppm to 530 ppm. Discrete sample results from the utility corridors located along Bon Brae Street and Lakeland Street ranged from 14 ppm to 2,100 ppm. The maximum concentration of 2,100 ppm was collected 4 to 5 feet bgs in the parkway of a commercial property on the corner of Bon Brae Street and Harper Avenue.

Former Martin Drain

In 2015, EPA investigated the former Martin Drain and collected a total of 80 samples from 45 borings. These were discrete samples intended to target the former Martin Drain pathway. Twenty-five of the 80 samples were collected within 2.5 feet bgs. The low-level near-surface PCB contamination related to the former Martin Drain generally decreases with distance from the commercial property at the corner of Harper Avenue and Lakeland Street. Three of the 25 near-surface samples had concentrations above 1 ppm. None of the 46 samples collected from the 25 borings installed from B Street (at the eastern edge of Investigation Area 1) to Jefferson Avenue contained PCB contamination above 1 ppm, as depicted by the dashed line on Figure 4. In fact, PCBs were not detected in the samples from the former Martin Drain east of B Street.

This means that the former Martin Drain is not a significant PCB migration pathway to Lake St. Clair. The results from the soil borings targeting the former Martin Drain showed that 7 properties had discrete samples with PCB concentrations exceeding 1 ppm.

As noted earlier, the water line utility corridors on Bon Brae Street and Lakeland Street are located in the space between the sidewalk and street also referred to as the parkway or right of way. During the former Martin Drain investigation, discrete samples were collected from areas where the former Martin Drain crossed these parkways. Some of the samples collected within the water line utility corridor exceeded the 10 ppm screening criterion including the following:

- Bon Brae Street parkway – 169 ppm at 3.4 feet bgs at one location; 48 ppm at 3.4 feet bgs at another location; and 13 ppm at 4 to 4.5 feet bgs at another location.
- Lakeland Street parkway – 19 ppm at 4 to 4.5 bgs at one location.

Roads

Twenty-four borings were advanced through Bon Brae Street during the RI. Four samples collected within 3 feet of the road surface (all located near vaulted manhole J01) had PCB concentrations above 10 ppm. The remaining 21 soil samples collected beneath Bon Brae Street within 3 feet of the road surface had PCB concentrations below 10 ppm.

Groundwater

Soil borings advanced at the site to a depth of 35 feet bgs did not encounter groundwater. The shallowest aquifer in the vicinity of the site is located approximately 80 feet bgs. Therefore, groundwater is not a medium of concern at the site.

Conceptual Site Model

A Conceptual Site Model (CSM) has been developed for the TMD site based on site characteristics and the results of multiple investigations conducted between 2002 and 2015. A CSM tells a story of how contamination at a site has moved and what impacts such movement may have had. The overall CSM for the TMD site suggests that the PCB-contaminated oil originated from a historical release at the commercial property (discussed earlier) located at the corner of Lakeland Street and Harper Avenue. It appears that PCB-contaminated oil was dumped or used for dust control on a former dirt parking lot on the eastern side of the building that was on that property at that time. The PCB contamination from the parking lot migrated, tracked out, and/or was transported by the following mechanisms:

- PCB contamination was likely tracked out of the parking lot and onto adjacent properties down Lakeland and Bon Brae Streets, as depicted in Figure 6.
- PCB contamination likely entered the TMD system during storm events, as depicted on Figure 7, and subsequently discharged into the Lange and Revere Street canals, where it adhered to the canal sediments.
- Residents along the Lange and Revere Street canals often placed pumps in the canals to water their yards, gardens, or clean boats. The pumps may have pulled water containing

suspended sediment particles, and this may have deposited PCB-contaminated sediment particles onto yards, as depicted in Figure 8.

- Investigations targeting the former Martin Drain identified PCBs in the area where the former Martin Drain crossed the parking lot of the commercial property. Figure 5 depicts where PCB contamination likely entered into the former Martin Drain and subsequently migrated along the open drain, depositing trace amounts of PCB contamination.

As noted earlier, this proposed plan addresses only near-surface soils. The PCB contamination within the TMD storm sewer system (including backfill materials) and in the canal sediments will be addressed in future decision documents.

Principal Threat Wastes

The principal threat concept is applied to the characterization of "source material" at a Superfund site. Source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contaminants to groundwater, surface water or air, or acts as a source for direct exposure. EPA has defined principal threat wastes as those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. EPA has not identified any principal threat wastes in the near-surface soils portion of the TMD site. The PCB-contaminated near-surface soils are primarily due to track-out of PCB contamination from the commercial property located at the corner of Harper Avenue and Lakeland Street. The re-deposited contamination has been mixed with near-surface soils, and the low-level concentrations of PCBs in the near-surface soils are considered to be low-level threat wastes.

SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

EPA has been managing the contamination at the TMD site through a phased approach. As described earlier, EPA selected two interim cleanup remedies early in the site characterization process – in September 2011 and May 2014 – to address high concentrations of PCBs that were serving as source materials in the TMD system. The interim source control measures were selected to mitigate the further migration of contamination to the canals while EPA continues the remedial process to select and implement final long-term remedial actions at the site. To date, the TMD site has not been divided into separate operable units.

The remedy recommended by this Proposed Plan would be the third remedial action at the site, and is intended to address PCB-contaminated near-surface soil in residential and commercial areas related to the TMD site. This action is intended to be the final response action for the near-surface soils portion of the site. The proposed response action does not address the PCB contamination remaining within the TMD system (including backfill materials) or in the canal sediments. A separate feasibility study (FS) is underway to address the TMD storm sewer system and the sediments in the Lange and Revere Street canals. When the FS is complete, EPA intends to develop a Proposed Plan and ROD to select a final remedy for those impacted areas. The action recommended in this Proposed Plan will neither be inconsistent with, nor preclude, implementation of a final site-wide remedy.

SUMMARY OF SITE RISKS

As part of the RI, EPA conducted a HHRA and a SLERA that evaluated current and potential risks to human health and the environment posed by all remaining areas of the site, including near-surface soils, the TMD system, and canal sediments. Because this Proposed Plan addresses only near-surface soils, the discussion below focuses on the risks posed by those soils. The risks posed by other areas of the site will be discussed and addressed in future decision documents.

EPA also prepared a separate technical memorandum to review residual PCB concentrations remaining at depth in the residential yards addressed during the 2014 TCRA. The results of that evaluation are discussed below in the *Preliminary Remediation Goals* section of this Proposed Plan.

Human Health Risks

The HHRA evaluated the risks to current and future residents (adults and young children), commercial property users and utility workers who may be exposed to PCBs in near-surface soils at residential properties, commercial properties and parkways through incidental ingestion, dermal absorption, and inhalation of soil/dust. As noted earlier, geostatistical soil sampling was used to assess the majority of residential yards and parkways. Geostatistical sampling divided residential properties into residential decision units (front yard, backyard and parkways). The sample results for each different decision unit were evaluated independently.

For CERCLA sites, EPA's acceptable risk range is an excess lifetime cancer risk (ELCR) of $1x10^{-4}$ (1 in 10,000) to $1x10^{-6}$ (1 in 1,000,000) or a non-cancer hazard index (HI) below 1. Contamination at a site is generally considered to present unacceptable risk if the ELCR exceeds $1x10^{-4}$ or the HI exceeds 1.

The current land uses (residential, commercial, and utility corridors located in parkways) evaluated in the HHRA are also assumed to be the reasonably anticipated future land uses. As discussed earlier in this Proposed Plan, groundwater is not a medium of concern at the TMD site, so current and potential beneficial uses of groundwater were not evaluated.

The HHRA identified PCBs as the only COC. The specific exposure scenarios evaluated, and the results of the HHRA evaluation, are summarized as follows:

- Residential soil: PCB concentrations above 1.2 ppm pose a potential unacceptable risk to pregnant women and children. To date, EPA has found dozens of residential decision units with soil concentrations exceeding this value.
- Commercial soil: PCB concentrations in the uncapped portions of the commercial property at the corner of Harper Avenue and Lakeland Street were less than MDEQ's commercial land-use DCC (16 ppm) and risks were within EPA's acceptable risk range. However, PCB concentrations beneath the parking lot were orders of magnitude higher than MDEQ's DCC for commercial properties and the risks exceed an H1 of 1.
- Utility corridor soil: Currently, PCB concentrations in three known utility corridors – Bon Brae Street, Lakeland Street, and the TMD utility corridor – exceed an HI of 1. Only

the Bon Brae Street and Lakeland Street utility corridors are addressed in this Proposed Plan. The TMD utility corridor will be addressed in future decision documents.

Ecological Risks

The SLERA evaluated potential effects of PCBs on ecological receptors inhabiting near-surface soils. The SLERA was conducted in accordance with EPA guidance for conducting ecological risk assessments. The data generated from the RI activities were used to assess potential risks for both lower trophic-level (direct exposure) and upper trophic-level (food web exposure) risks for a variety of terrestrial receptors using multiple lines of evidence in a weight-of-evidence process, which includes assessing risk estimates in context with the extent, magnitude, and ecological significance of each line of evidence. Based on the weight-of-evidence evaluation, total PCBs were not identified as presenting unacceptable ecological risk in upland terrestrial soils or residential and commercial properties. EPA therefore believes that taking an action to address potential risk to ecological receptors in near-surface soils is not warranted.

Conclusion

It is EPA's current judgement that the Preferred Alternative identified in this Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are goals for protecting human health and the environment. RAOs are developed to address the contaminant levels and exposure pathways that present unacceptable current or potential future risk to human health and the environment.

The following RAOs were developed for near-surface soils at the TMD site based on a consideration of the contaminant levels and exposure pathways found to present potentially unacceptable risk to human health and the environment as determined during the RI:

- Prevent direct human contact with or ingestion and inhalation of PCBs in soils at residential and commercial properties by current and potential future residents during typical residential activities that could result in an unacceptable risk to human health, such as playing in the yard, gardening, and landscaping.
- Prevent direct human contact with or ingestion and inhalation of PCBs in utility corridor soils by current and potential future utility workers during construction activities within parkway utility corridors that could result in an unacceptable risk to human health.

Preliminary Remediation Goals

Preliminary remediation goals (PRGs) are risk-based or ARAR-based chemical-specific concentrations that help further define the RAOs. PRGs are considered "preliminary" until final remedial goals or cleanup levels are selected in a ROD. PRGs are used to help define the extent of contaminated media requiring remedial action.

The following PRGs were established for the near-surface soils addressed by this Proposed Plan:

- Residential soil: 1 ppm. This PRG is consistent with TSCA, which was identified as the primary chemical-specific ARAR, and would be protective of human health because:
    - It is below a non-cancer HI of 1;
    - It is within EPA's acceptable cancer risk range of 10^{-4} to 10^{-6} (which for residential soils equates to concentrations from 23 ppm to 0.23 ppm);
    - It meets the cleanup level for "high occupancy areas" under TSCA (see 40 CFR 761.61(a)(4)(i)(A)); and
    - It is below the likely future MDEQ residential DCC of 1.9 ppm.
- Commercial soil: 10 ppm. This PRG is consistent with TSCA, which was identified as the primary chemical-specific ARAR, and would be protective of human health because:
    - It is below a non-cancer HI of 1;
    - It is within EPA's acceptable risk range of 10^{-4} to 10^{-6} (which for industrial soil equates to concentrations from 97 ppm to 0.97 ppm);
    - It meets the cleanup level for "low occupancy areas" under TSCA (see 40 CFR 761.61(a)(4)(i)(B)); and
    - It is below the likely future MDEQ commercial DCC of 20 ppm.
- Utility corridor soil: 21 ppm. This PRG for utility workers is based on a site-specific utility/construction worker exposure scenario, which includes workers in contact with soil beneath the road surface or in utility corridors and assumes an exposure frequency of 20 days per year, an exposure duration of 5 years, and a target ELCR of 1×10^{-6}. This PRG would be protective of human health because:
    - It is based on the site-specific exposure scenario with a target HI of 1; and
    - It is within EPA's acceptable risk range of 10^{-4} to 10^{-6}.

Summary of Existing Data Compared to PRGs

The PCB data collected to date is summarized below. As noted earlier, geostatistical sampling results in a calculated, representative concentration over an entire decision unit and provides a more accurate assessment of human exposure for a given decision unit than discrete samples.

- Residential soil: Eighty-four residential decision units at a total of 57 properties were geostatistically sampled. Thirty-two residential decision units at a total of 25 properties were found to exceed the 1 ppm PRG. These residential decision units are within Investigation Areas 1 and 2 as depicted on Figure 4.
- Commercial soil: The discrete sample concentrations in the uncapped portions of the commercial property are below the 10 ppm PRG. The discrete sample concentrations collected from beneath the parking lot ranged from 45 ppm to 530 ppm. Based on the available data, EPA assumes that the PCB concentrations in the top 2.5 feet of soil beneath the parking lot would exceed the 10 ppm PRG if geostatistically sampled.
- Utility corridor soil: Three parkways located in Investigation Area 1 had discrete soil sample PCB results exceeding 21 ppm. These parkways would require pre-design geostatistical sampling.

Pre-design studies would be needed to determine the total number of residential, commercial and utility corridor decision units requiring cleanup. New properties would likely be sampled to refine the total number of decision units requiring remediation. Additional sampling may also be needed at other properties if EPA determines that more information is needed to complete the remedial design. Currently-known pre-design properties requiring geostatistical sampling include the following:

- Three parkways (utility corridor soils, identified above) that have only discreet samples;
- Approximately twenty-eight decision units at 18 properties (17 residential and 1 commercial) that have only discreet samples from earlier investigations;
- Nine of the 32 residential decision units (identified above) that exceed 1 ppm but do not have the vertical extent of PCB contamination delineated deeper than 2 feet bgs;
- Approximately 35 decision units not yet sampled from Investigation Area 1; and
- Approximately 77 backyard and front yard decision units not yet sampled from Investigation Area 2.

Based on the above factors, EPA currently estimates that 152 decision units would need pre-design sampling.

For purposes of volume and cost estimating in the FS, EPA had to estimate the number of residential, commercial, and utility corridor decision units (or properties) and the volume of soil that would require remediation, as follows:

- The estimated number of residential decision units that would require remediation is 102 (approximately 68 properties). This number includes the existing 32 decision units already known to exceed the 1 ppm PRG plus an estimated 70 additional decision units that might be identified during pre-design sampling in Investigation Areas 1 and 2.
- The estimated number of commercial properties that would require remediation is 2.
- The estimated number of utility corridor decision units in parkways that would require remediation is 3.
- The estimated volume of contaminated soil that would need to be excavated is 9,955 cubic yards.

Evaluation of Residual PCB Concentrations Following 2014 TCRA

As noted earlier, the 2014 TCRA used a cleanup number of 4 ppm PCBs, based upon the current Michigan Part 201 residential DCC. All soils exceeding 4 ppm were removed from the properties addressed by the TCRA, and the properties were then backfilled with clean soil. PCB concentrations less than 4 ppm but above 1 ppm are known to be present at depth, beneath the layer of clean backfill, in 6 residential decision units (5 parkways and 1 back yard) on Lakeland Street. During the near-surface soils FS, EPA risk assessors conducted a technical review of the PCB concentrations that remain at depth at the TCRA-remediated residential decision units. The review concluded that, although PCBs above 1 ppm remain at depth, the PCB concentrations are low (less than 4 ppm) and the clean backfill layer on top of the low PCB concentrations provides

an adequate direct-contact barrier. Therefore, unacceptable exposures have been effectively mitigated at these residential decision units and they do not need to be re-excavated.

SUMMARY OF REMEDIAL ALTERNATIVES

The near-surface soils FS identified ICs, containment, and treatment as general response actions for mitigating potential risks posed by PCB-contaminated near-surface soils on affected properties. Ultimately, both containment and treatment remedial technologies were screened out based on an evaluation of three specified criteria: effectiveness, implementability, and relative cost. As a result, those remedial technologies were not carried forward in the FS and are not included in a remedial alternative. For example, thermal treatment, with poor implementability and high cost, would require the installation of a system to increase soil temperatures and a large amount of infrastructure and equipment necessary for multiple areas to be treated. Containment technologies for soil would include caps, which are impracticable to implement at residential and commercial properties. The remedial technologies that remained following the screening process include excavation, appropriate disposal, and ICs. For the above reasons, this Proposed Plan includes only 2 remedial alternatives.

The two remedial alternatives for the near-surface soils at the TMD site presented below are numbered to correspond with the numbers used in the 2017 *Near-Surface Soils FS Report*. Additional details regarding the alternatives are provided in that document.

EPA is recommending that Alternative 2 be selected as the remedy for near-surface soils.

Alternative 1: No Action

Regulations governing the Superfund program require that the "no action" alternative be evaluated generally to establish a baseline for comparison. Under this alternative, EPA would take no additional action to prevent exposure to contaminated near-surface soils, and the PCB-impacted soils would remain in place at the site. There would be periodic costs associated with five-year reviews, since the NCP requires five-year reviews as long as hazardous substances remain at the site at concentrations that do not allow for unlimited use and unrestricted exposure.

Estimated Capital Cost: $0
Estimated Annual Operation and Maintenance (O&M) Cost: $0
Estimated Periodic Cost: $20,000 (every five years)
Estimated Total Present Worth: $95,000
Estimated Remedial Action Construction Timeframe: none – no construction would occur

Alternative 2: Excavation and Off-Site Disposal of Contaminated Near-Surface Soils

Alternative 2 consists of excavating near-surface soils with total PCB concentrations exceeding selected cleanup levels to a specified maximum depth (depending on property type), followed by off-site disposal at an appropriate landfill. It is anticipated that most, if not all, of the excavated soils would go to a RCRA Subtitle D solid waste landfill, but excavated soils from any decision unit with PCB concentrations greater than 50 ppm would go to a TSCA-approved landfill.

Alternative 2 includes the following primary components:

- Excavating contaminated near-surface soils exceeding selected cleanup levels to maximum depths of 2.5 feet bgs at residential and commercial properties and 6 feet bgs within utility corridors;
- Transporting and disposing of excavated soils at a permitted RCRA Subtitle D landfill (for soils less than 50 ppm PCBs) or TSCA landfill (for soils greater than 50 ppm PCBs);
- Backfilling excavated areas with uncontaminated off-site backfill soil and topsoil;
- Restoring areas impacted by the cleanup work to original conditions, to the extent practicable;
- Providing watering services for up to 4 weeks to ensure successful restoration of remediated properties; and
- Implementing ICs and/or a visual barrier, if deemed necessary, for properties where PCB concentrations exceed selected cleanup levels in soil deeper than the maximum excavation depths described above.

EPA would need to obtain access agreements from current property owners for pre-design sampling and cleanup work. As noted earlier, pre-design soil sampling would need to be conducted to determine the actual number of decision units requiring cleanup and the vertical extent of contamination. Pre-design sampling using geostatistical sampling methods would be conducted at residential yards, parkway/utility corridors and commercial properties that were either not previously sampled or sampled only through discrete sampling. Pre-design geostatistical sampling would also be conducted where needed to determine whether PCB concentrations exceed selected cleanup levels at depths greater than 2.5 feet bgs.

Pre-design sampling would verify the CSM, determine excavation limits, and identify residential and/or commercial properties where ICs and/or visual barriers may be needed after the upper 2.5 feet of soil are removed. With adequate pre-design sampling, confirmation soil samples following excavation would not be required. The analytical results from surface soil samples collected during the site investigations indicate PCB concentrations decrease with depth at both residential and commercial properties, with the highest concentrations typically found within 2.5 feet bgs, so PRG exceedances deeper than 2.5 feet bgs are not anticipated on residential and commercial properties. In isolated cases where the pre-design results indicate PCB concentrations exceed selected cleanup levels in soil deeper than 2.5 feet bgs, limited additional soil may be excavated if determined to be more cost-effective than implementing ICs, installing a visual barrier, and/or needing to conduct five-year reviews at the properties in question.

Alternative 2 would require an estimated 247 truck trips to haul away excavated PCB-impacted soil and 247 truck trips to haul in clean backfill and topsoil. Based on data presented in the RI Report, the following table summarizes the range of PCB concentrations detected in near-surface soils at the site compared to the relevant PRGs.

TABLE 2: Concentration Range of PCB-impacted Soils			
Property Type	**Range of Detected Concentrations**	**Depth of highest concentration**	**PRG**
Residential*	0.23 ppm to 14 ppm	0 to 0.5 feet bgs in parkway	1 ppm
Commercial**	0.6 ppm to 530 ppm	1.5 to 2 feet bgs underneath paved parking lot	10 ppm
Utility Corridor**	0.23 ppm to 2,100 ppm	4 to 5 feet bgs	21 ppm

* Geostatistical sample data
**Discrete sample data

In developing the cost estimate for Alternative 2, EPA assumed – based on the existing data – that the PCB concentrations on residential properties would not be high enough to require excavated soils to be disposed of in a TSCA-permitted landfill. Based on the discrete sample data from commercial and utility corridor soils, the FS cost estimate assumed that excavated soils from those properties would require off-site disposal at a TSCA landfill. Pre-design geostatistical sampling would be conducted to determine if any of the near-surface soils would need to go to a TSCA-approved landfill for disposal.

Estimated Capital Cost: $7.68 million
Estimated Annual O&M Cost: $0
Estimated Periodic Cost: $20,000 (every five years)
Estimated Total Present Worth: $7.79 million
Estimated Remedial Action Construction Timeframe: 6 months

EVALUATION OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives. The purpose of this evaluation is to promote consistent identification of the relative advantages and disadvantages of each alternative, thereby guiding selection of remedies offering the most effective and efficient means of achieving site cleanup goals. While all nine criteria are important, they are weighed differently in the decision-making process depending on whether they evaluate protection of human health and the environment or compliance with federal and state requirements, standards, criteria, and limitations (threshold criteria); consider technical or economic merits (primary balancing criteria); or involve the evaluation of non-EPA reviewers that may influence an EPA decision (modifying criteria). These nine criteria are described below, followed by a discussion of how each alternative meets or does not meet each criterion.

Explanation of the Nine Evaluation Criteria

Threshold Criteria

1. ***Overall Protection of Human Health and the Environment*** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed by the site are eliminated, reduced or controlled through treatment, engineering, or institutional controls.
2. ***Compliance with Applicable or Relevant and Appropriate Requirements*** addresses whether a remedy will meet the applicable or relevant and appropriate federal and state requirements, known as ARARs.

Primary Balancing Criteria

3. ***Long-Term Effectiveness and Permanence*** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met.
4. ***Reduction of Toxicity, Mobility, or Volume Through Treatment*** addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as their principal element. This preference is satisfied when treatment is used to reduce the principal threats at the site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.
5. ***Short-Term Effectiveness*** addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction of the remedy until cleanup levels are achieved. This criterion also considers the effectiveness of mitigative measures and time until protection is achieved through attainment of the remedial action objectives.
6. ***Implementability*** addresses the technical and administrative feasibility of a remedy from design through construction, including the availability of services and materials needed to implement a particular option and coordination with other governmental entities.
7. ***Cost*** includes estimated capital costs, annual O&M costs, other periodic costs, and the total present worth of capital, O&M (including long-term monitoring) and periodic costs.

Modifying Criteria

8. ***State Agency Acceptance*** considers whether the state support agency supports the preferred alternative presented in the Proposed Plan and concurs with the selected remedy.
9. ***Community Acceptance*** addresses the public's general response to the remedial alternatives and the preferred alternative presented in the Proposed Plan.

Each of the nine evaluation criteria are discussed below with respect to the alternatives under consideration for this remedial action. In addition, Table 3 provides a qualitative summary of how the cleanup alternatives compare against the first seven criteria. The remaining two criteria

will be evaluated following the public comment period for the Proposed Plan. More details regarding the evaluation and comparison of the cleanup alternatives against the nine criteria can be found in the 2017 *Near-Surface Soils FS Report*.

Comparison of Alternatives

1. Overall Protection of Human Health and the Environment

Under Alternative 1, no action would be taken to contain or treat PCB concentrations exceeding selected cleanup levels in the near-surface soils at the TMD site. Alternative 1 would provide no improvement over current conditions, would provide no risk reduction, and would not be protective of human health or the environment.

Alternative 2 is expected to be an effective remedy for near-surface soils that would be protective of human health and the environment by eliminating the direct contact, ingestion, and inhalation exposure pathways through excavation and off-site disposal of the contaminated soil.

Alternative 2 would be permanent and protective. However, PCB concentrations exceeding selected cleanup levels may be encountered at a few residential and commercial decision units at depths greater than 2.5 feet. At such properties, depending on the specific circumstances, EPA may elect to extend excavations in these limited and isolated areas to remove the affected soils. Such excavation work below 2.5 feet would occur only if the limited additional soil removal is determined to be more cost-effective than implementing ICs, installing a visual barrier, and/or needing to conduct five-year reviews at the residential or commercial properties in question. If removing the additional soils is not cost-effective, EPA would rely on ICs and/or a visual barrier above the contaminated soil and beneath the clean backfill soil, such as orange construction fence or landscape fabric, to provide a warning barrier to help prevent direct human contact and exposure.

2. Compliance with ARARs

Alternative 1 would not meet ARARs. This alternative does not comply with requirements of CERCLA because there would be no remediation to protect human health. Therefore, Alternative 1 does not meet either of the two threshold criteria.

Alternative 2 would meet all federal and state ARARs. A list of the potential ARARs for the proposed remedial action to address near-surface soils can be found in Table 4.

3. Long-term Effectiveness and Permanence

Alternative 1 would not provide any long-term effectiveness or permanence, as no remedy would be implemented. Alternative 2 would be effective in the long term and permanent because soils with PCB concentrations exceeding selected cleanup levels in the uppermost 2.5 feet at impacted residential and commercial decision units would be permanently removed from the properties and replaced with clean materials.

As noted earlier, pre-design sampling may show that a few decision units have PCB concentrations exceeding selected cleanup levels at depths greater than 2.5 feet bgs. At such locations, EPA may elect to extend excavations in these limited and isolated areas to remove the affected soils if it is determined to be more cost-effective to do so than implementing ICs, installing a visual barrier, and/or conducting five-year reviews at such properties. If removing the additional soils is not cost-effective, then ICs and/or a visual barrier would be required for the contamination remaining in place at depth. Such measures are considered to be effective in the long term and permanent and would serve to minimize the potential for future disturbance of contaminated soil at depth. If deemed to be cost-effective, excavation of the soils at depth would also be effective in the long term and would provide an added degree of permanence because the deeper contaminated soils would be permanently removed from the property.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Neither Alternative 1 nor Alternative 2 employs treatment technologies to reduce the toxicity, mobility, or volume of the contaminated soils. Neither alternative satisfies EPA's statutory preference for remedial actions that employ treatment technologies as a principal element. The majority of the PCB-impacted near-surface soil at the TMD site is considered low-level threat waste material that does not lend itself to any cost-effective treatment.

5. Short-term Effectiveness

Alternative 1 has no action associated with it so would have no associated short-term impacts. Alternative 2 could have some short-term impacts to workers, the community, and the environment because of disruption caused by cleanup activities, such as soil excavation work and additional truck traffic to haul excavated soil to off-site disposal facilities and to import clean fill to excavated areas. These potential impacts could be controlled through adequate monitoring and appropriate mitigative actions.

If excavation occurs during dry conditions, residents and construction workers could be exposed to contaminated airborne dust particles. Dust suppression measures would be required. Additional short-term risks to workers include occupational construction risks associated with equipment. Such risks would be mitigated by site-specific health and safety measures, a traffic plan, and a construction quality assurance plan. Other potential impacts from soil excavation are related to the potential for runoff to infiltrate the storm water drainage system. Such impacts would be averted by environmental control plan measures and through the use of erosion and sediment controls and good housekeeping practices.

The PRGs would be met in soils to a depth of 2.5 feet upon completion of the excavation work in residential and commercial decision units. PRGs would be met in soils to a depth of up to 6 feet upon completion of the excavation work in utility corridors, with the depth of excavation dependent on pre-design sample results. Based upon the assumed number of properties/decision units that may be found to require cleanup, the entire length of time for the remedial action construction (including excavation, backfilling, and restoration work) is estimated to be 6 months for Alternative 2.

6. Implementability

Alternative 1 has no actions that would be implemented. The remedy components of Alternative 2 are proven, readily implementable, and have been used successfully for other environmental cleanup projects. Alternative 2 could be implemented with readily available materials and methods, and is administratively feasible. The most critical factors associated with the ability to implement Alternative 2 are community acceptance and obtaining access agreements from property owners to conduct pre-design sampling and remedial action work.

7. Cost

In accordance with EPA guidance, FS cost estimates are expected to be accurate within a range of +50 to -30 percent. A present worth analysis is used to evaluate expenditures that occur over different time periods by discounting all future costs to a common base year, usually the current year. This allows the cost of remedial action alternatives to be compared on the basis of a single figure representing the amount of money that, if invested in the base year and disbursed as needed, would be sufficient to cover all costs associated with the remedial action over its planned life.

The total present worth cost estimate for Alternative 1 is $95,000. The total present worth cost estimate for Alternative 2 is $7.79 million. A 1.4% discount factor[2] was used to develop the present worth cost estimate. The final cost estimate for the selected remedial action would be developed and refined during the remedial design process.

8. State/Support Agency Acceptance

MDEQ has indicated its support for the Preferred Alternative – Alternative 2 – described in this proposed plan.

9. Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the Near-Surface Soils ROD.

PREFERRED ALTERNATIVE

EPA's Preferred Alternative: Alternative 2 - Excavation and Off-Site Disposal of Contaminated Near-Surface Soils

Based on the evaluation above, EPA is proposing Alternative 2 as the most appropriate cleanup alternative for PCB-contaminated near-surface soils at the Ten-Mile Drain Superfund site. The Preferred Alternative consists of the following main components:

- Excavating contaminated near-surface soils exceeding selected cleanup levels to maximum depths of 2.5 feet bgs at residential and commercial properties and up to 6 feet

[2] EPA used a discount rate of 1.4% to calculate total present worth costs, consistent with the current Office of Management and Budget Circular A-94.

bgs within utility corridors. Based on extrapolations from currently available data, EPA estimates that approximately 102 residential decision units (or approximately 68 properties), 2 commercial properties, and 3 utility corridor decision units in parkways would need to be cleaned up, with an estimated total volume of 9,955 cubic yards of contaminated soil excavated;

- Transporting and disposing of excavated soils at a permitted RCRA Subtitle D landfill (for soils less than 50 ppm PCBs) or TSCA landfill (for soils greater than 50 ppm PCBs);
- Backfilling excavated areas with uncontaminated off-site backfill soil and topsoil;
- Restoring areas impacted by the cleanup work to original conditions, to the extent practicable;
- Providing watering services for up to 4 weeks to ensure successful restoration of remediated properties; and
- Implementing ICs and/or a visual barrier, if deemed necessary, for properties where PCB concentrations exceed selected cleanup levels in soil deeper than the maximum excavation depths described above.

EPA would need to obtain access agreements from current property owners for pre-design sampling and cleanup work. In order to determine the actual number of decision units requiring cleanup and the vertical extent of contamination, pre-design sampling using geostatistical sampling methods would be conducted at residential yards, parkways/utility corridors and commercial properties that were either not previously sampled or sampled only through discrete sampling. Pre-design geostatistical sampling would also be conducted where needed to determine whether PCB concentrations exceed selected cleanup levels at depths greater than 2.5 feet bgs on residential and commercial properties.

Pre-design sampling would verify the CSM, determine excavation limits, and identify residential and/or commercial properties where ICs and/or visual barriers may be needed after the upper 2.5 feet of soil are removed. With adequate pre-design sampling, confirmation soil samples following excavation would not be required. The analytical results from surface soil samples collected during the site investigations indicate PCB concentrations decrease with depth at both residential and commercial properties, with the highest concentrations typically found within 2.5 feet bgs, so PRG exceedances deeper than 2.5 feet bgs are not anticipated. In isolated cases where the pre-design results indicate PCB concentrations exceed selected cleanup levels in soil deeper than 2.5 feet bgs, limited additional soil may be excavated if determined to be more cost-effective than implementing ICs, installing a visual barrier, and/or needing to conduct five-year reviews at the properties in question.

Summary of Rationale for the Preferred Alternative

As discussed earlier, EPA carried two alternatives through the detailed evaluation process of the FS. Alternative 2, Excavation and Off-Site Disposal of Contaminated Near-Surface Soils, is the Preferred Alternative. Alternative 2 is recommended because it would be protective of human health and the environment, would meet the RAOs for this proposed remedial action, and would meet all federal and state ARARs. Alternative 1, No Action, does not meet either of the two threshold criteria and therefore is not eligible to be selected.

Alternative 2 includes proven and effective technologies for remediating PCB-impacted soils at residential, commercial and other properties. Alternative 2 does not employ treatment technologies to reduce the toxicity, mobility, or volume of the contaminated soils because the majority of the PCB-impacted near-surface soil at the TMD site is considered low-level threat waste material that does not lend itself to any cost-effective treatment.

Alternative 2 would provide long-term and permanent protection against exposure to contaminated soils by excavating contaminated soils from the impacted residential neighborhoods and transporting the soils off-site for disposal at a permitted RCRA Subtitle D or TSCA landfill. Alternative 2 would be cost-effective and readily implementable. Alternative 2 would provide short-term effectiveness when proper site-specific health and safety measures, monitoring, and mitigative measures are conducted.

Based on information currently available, EPA believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. EPA expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element, or explain why the preference for treatment will not be met.

COMMUNITY PARTICIPATION

Next Steps

EPA, in consultation with MDEQ, will evaluate public reaction to the Preferred Alternative during the public comment period before selecting a final cleanup alternative as the near-surface soils remedy. Based on new information or public comments, EPA may modify its Preferred Alternative. EPA encourages the public to review and comment on both of the cleanup alternatives discussed in this Proposed Plan.

EPA will respond in writing to all significant comments in a Responsiveness Summary, which is part of the ROD. EPA will announce the selected cleanup alternative in local newspaper advertisements and will place a copy of the ROD in the local information repository.

FIGURE 1

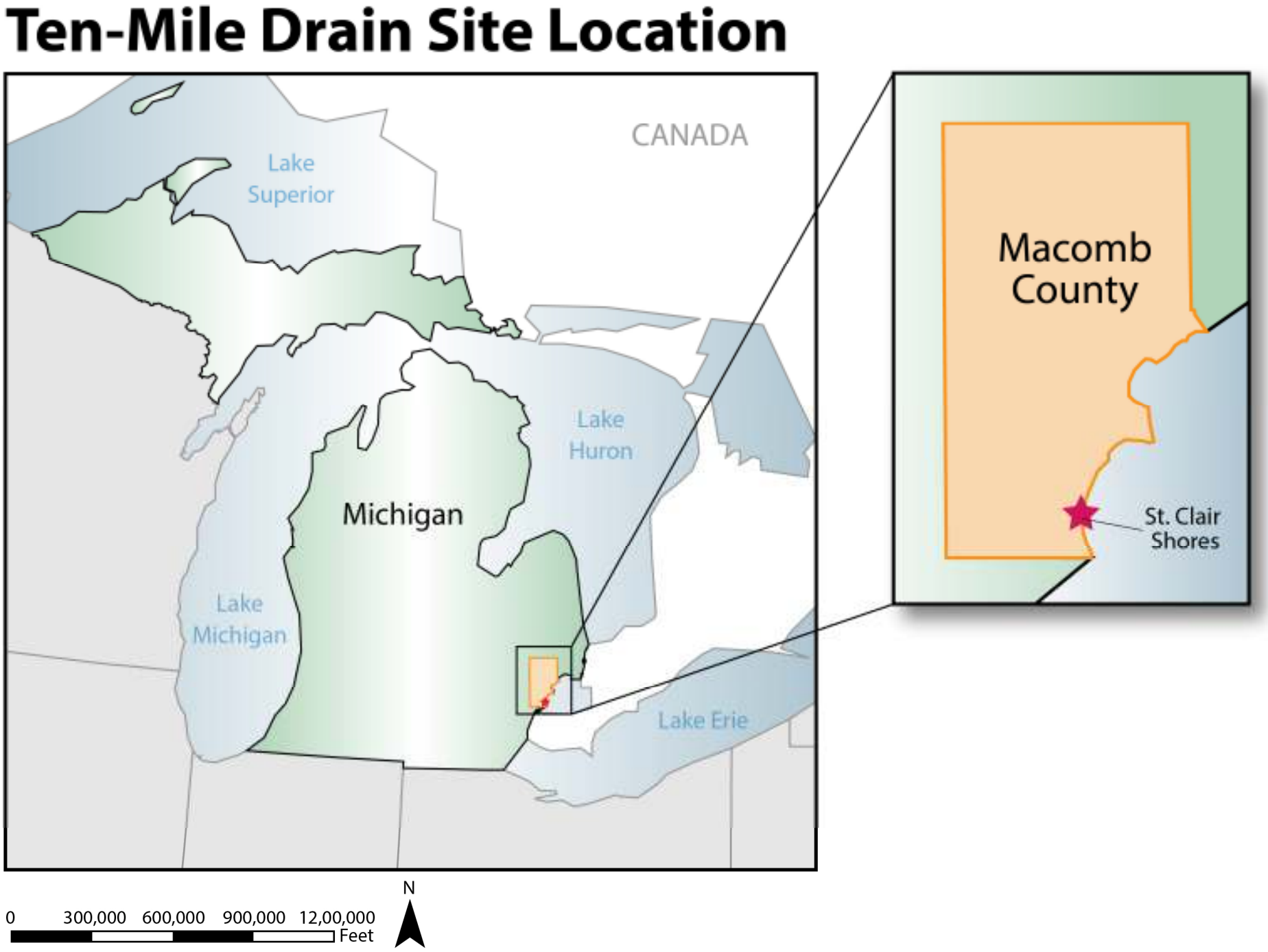

Ten-Mile Drain Site Location
CANADA
Lake Superior
Lake Huron
Michigan
Lake Michigan
Lake Erie
Macomb County
St. Clair Shores
N
0
300,000
600,000
900,000
12,00,000
Feet

FIGURE 2
Ten Mile Drain Storm Sewer System

FIGURE 3

Lange and Revere Street Canals (outfall)

FIGURE 4

Investigation Area 1 and Investigation Area 2
(Former Martin Drain pathway)

FIGURE 5

Former Martin Drain through Investigation Area 1

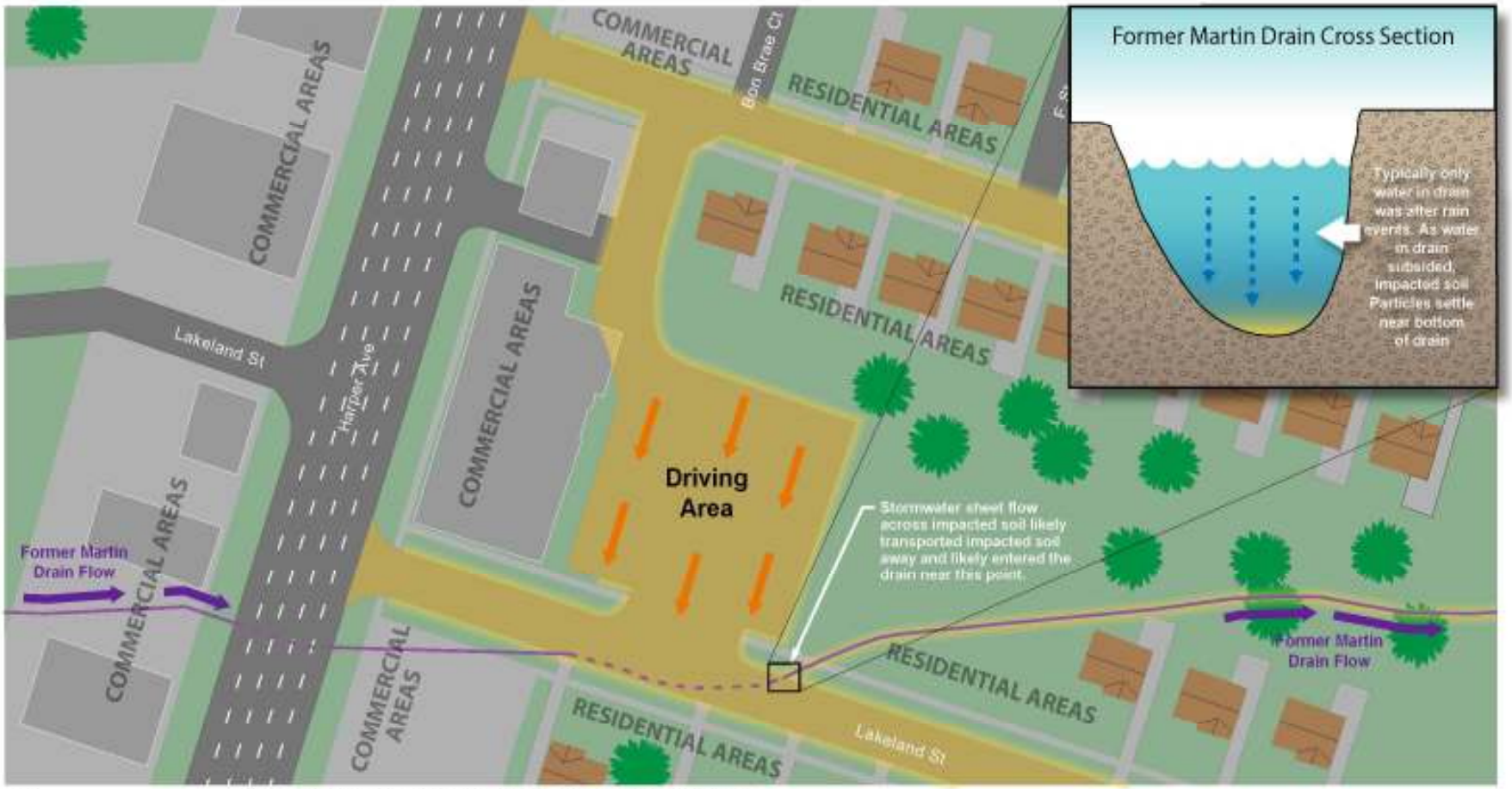


FIGURE 6

Conceptual Site Model
(track out)

FIGURE 2
Surface Soil Contamination Model
Focused Feasibility Study
Residential and Commercial Near Surface Soils
Ten-Mile Drain Superfund Site
St. Clair Shores, Michigan

ch2m:

FIGURE 7

Conceptual Site Model– TMD system

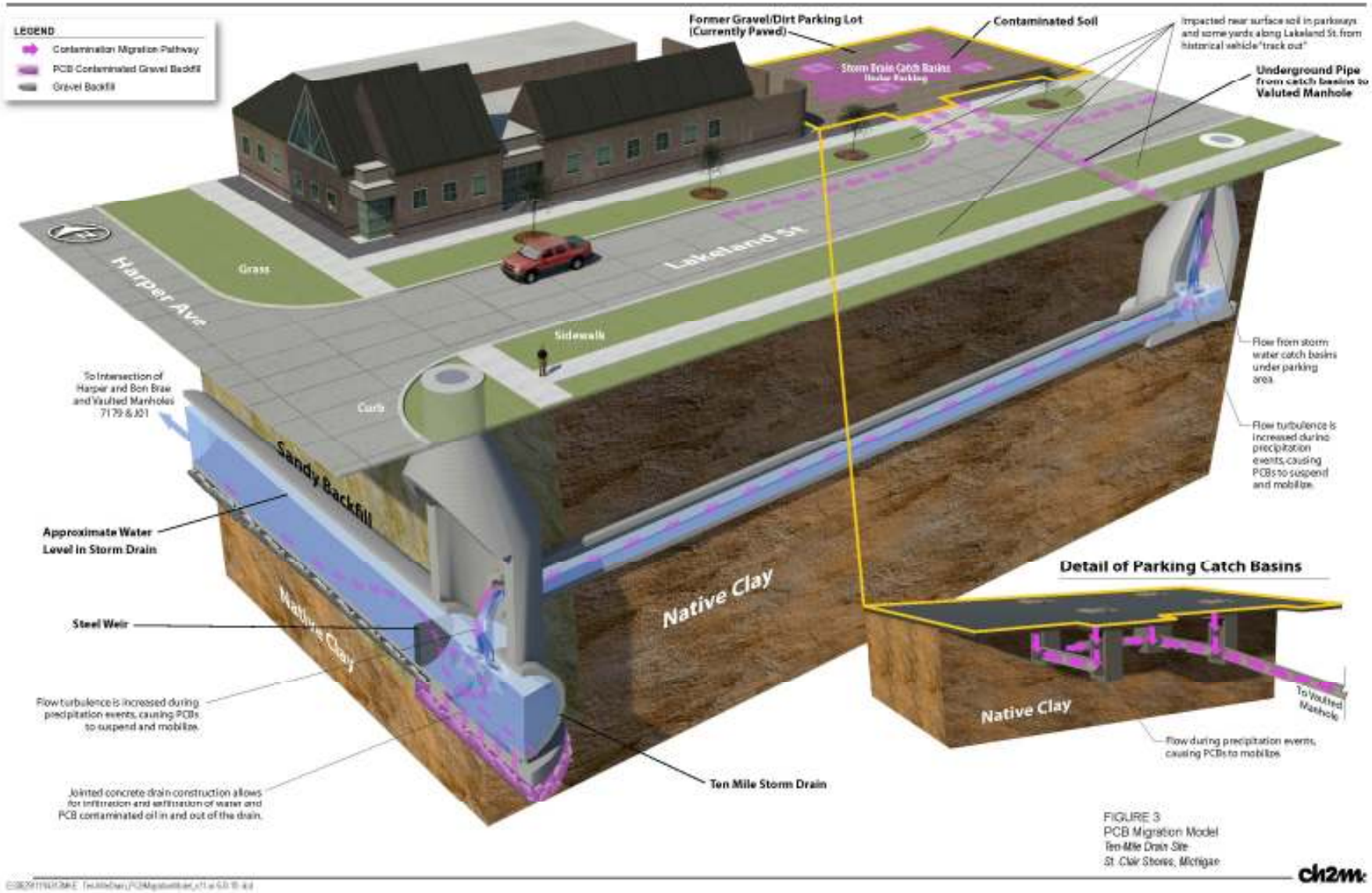
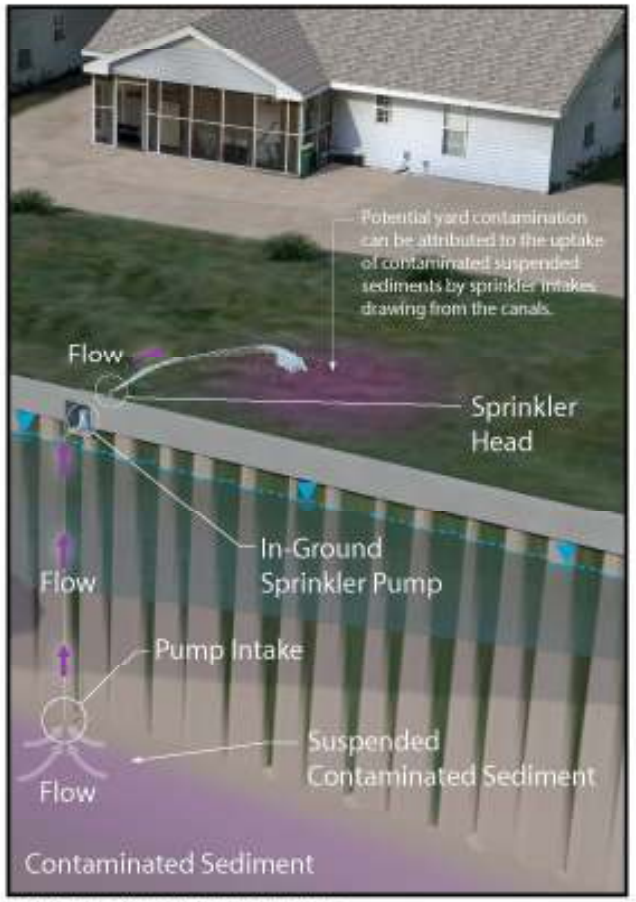


FIGURE 8

Conceptual Site Model– Canals

(PCB-contaminated sediment particles)

Note: This is a contaminant pathway model only and is not intended to represent actual conditions at specific property locations



Note: Seiche effect assists in stirring bottom sediments to suspend them.

LEGEND

= Water Level

= Contaminated Suspended Sediments

FIGURE 5
Canal Property Contamination Model
Ten Mile Drain Site
St. Clair Shores, Michigan

ch2m:

TABLE 3

Comparing Potential Clean-up Alternatives with the Nine Superfund Remedy Selection Criteria

Evaluation Criteria	Alternative 1 No Action	Alternative 2* Excavation and Off-Site Disposal of Contaminated Near-Surface Soils
Overall Protection of Human Health and the Environment	□	■
Compliance with ARARs	□	■
Long-Term Effectiveness and Permanence	□	■
Reduction of Toxicity, Mobility, or Volume Through Treatment	□	□
Short-Term Effectiveness	■	■
Implementability	□	■
Total Present Worth	$95,000	$7.8 million
State Acceptance	MDEQ has indicated its support for Alternative 2	
Community Acceptance	Will be evaluated after public comment period	
■ – Meets Criteria ◪ - Partially Meets Criteria □ – Does Not Meet Criteria		

***EPA's Recommended Alternative**

Table 4: Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards- Near-surface soils

Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan

Regulation	Requirement	Potential ARAR Status	Analysis
Chemical-specific ARARs or TBCs			
Federal			
40 CFR 761.61(a)(1)(ii) and 40 CFR 761.61(c) –TSCA Regulations	Establishes requirements and thresholds for remediation and management of PCBs. Provides for risk-based cleanup.	Relevant and Appropriate	Relevant and appropriate for establishing remedial goals for soil that is PCB Remediation waste. Requirements are not binding on CERCLA sites 761.61 (a)(1)(ii)).
CERCLA Guidance on Land Use in the CERCLA Remedy Selection Process	Establishes appropriate considerations in defining future land use.	TBC	CERCLA provides guidance to EPA in selecting land use for remedy selection purposes. These requirements are TBCs.
EPA Regional Screening Level Table for Chemical Contaminants at Superfund Sites	Screening levels developed using risk assessment guidance from the EPA Superfund program. They are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. Screening levels are considered to be protective for humans over a lifetime; however, screening levels do not address non-human health endpoints, such as ecological impacts.	TBC	Levels may be considered for use as initial cleanup goal. These requirements are TBCs.
State			
Part 201, Environmental Remediation, of NREPA, 1994 PA 451, as amended. (MCL 324.201, et seq.) Michigan Administrative Codes R 299.46, R299.48, R299.49, and R299.50	Part 201 provides for the identification, risk assessment, evaluation, remediation, and long-term management of contaminated sites within Michigan. Part 201 provides that response actions shall be protective of human health, safety, welfare and the environment of the state and identifies risk levels to be used in the development of those response actions at MCL 324.20120a.	Relevant and Appropriate	Establishes cleanup criteria for sites of environmental contamination based on current and future land use. Regulates cleanup of releases of hazardous substances in concentrations that constitute a facility as that term is defined in Section 20101(o) of Act 451 to soil and groundwater.

Table 4: Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards- Near-surface soils

Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan

Regulation	Requirement	Potential ARAR Status	Analysis
Location-specific ARARs or TBCs			
Federal			
Migratory Bird Treaty Act of 1972 16 USC 703-712	Establishes federal responsibility for the protection of the international migratory bird resources. Consultation with the USFWS during remedial design and remedial construction is strongly encouraged to ensure that the cleanup of the site does not unnecessarily impact migratory birds. Taking, killing, or possessing migratory birds is unlawful with authorization from USFWS.	Applicable	Michigan is located within the Mississippi flyway. If migratory birds, their nests, or eggs are discovered, disturbed will be avoided to the extent practicable, and will be coordinated with USFWS.
50 CFR 17 – Threatened and Endangered Species Protection	Requires that federal agencies ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify critical habitat.	Applicable	Habitats and the presence of threatened and endangered species and their habitats will be evaluated as the alternatives assessment progresses. Measures will be taken to avoid jeopardizing fish, wildlife, or plant species or destroying or adversely modifying critical habitat, to the extent practicable.
15 CFR 930 – Coastal Zone Management	Requires that federal agencies conducting activities directly affecting the coastal zone conduct those activities in a manner that is consistent, to the maximum extent practicable, with approved state coastal zone management programs.	Applicable	Coastal zone management applies to construction activities and aims to achieve a balance between natural resources preservation and economics. Because the project does not include economic development, it is unlikely that substantive requirements will relate to the remedy.
State			
NREPA, Part 365, Endangered Species Protection, and MCL 324.36501-36507), and Michigan Administrative Code R 299.1021-1028	Establishes requirements for conservation, management, enhancement, and protection of species either endangered or threatened with extinction.	Relevant and Appropriate	Relevant and appropriate for actions that are likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat. Would not be considered applicable unless federal endangered species law is less stringent.

Table 4: Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards- Near-surface soils

Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan

Regulation	Requirement	Potential ARAR Status	Analysis
NREPA Part 401, Wildlife Conservation. (MCL 324.40101-40120)	Regulates wildlife conservation.	Relevant and Appropriate	May be applied to identifying wildlife habitat near environmental sites of contamination where an ecological risk assessment(s) may be conducted. May be used in conjunction with the Michigan Features Inventory List to identify habitat where an environmental site of contamination may impact wildlife.
Action-specific ARARs or TBCs			
State			
NREPA Part 115, Solid Waste Management). (MCL 324.1 1501 et seq.) Michigan Administrative Code R 299.41 01-4122 (Formerly known as Act 641 [1978])	Addresses solid waste management and imposes geographic limitations on where nonhazardous solid waste can be disposed.	Relevant and Appropriate	Regulates the disposal of nonhazardous solid waste. Remedial action may produce nonhazardous solid waste. Used for determining the process and type of disposal facility that solid waste or contaminated media may be removed to. It is anticipated that site soils will contain less than 50 ppm PCBs and will be disposed of in a commercial Resource Conservation and Recovery Act Subtitle D facility approved under the CERCLA Offsite Rule.
NREPA, R 323.1709 – Erosion and Sediment Control	Establishes requirements for the control of erosion and sedimentation during earth change operations.	Applicable or Relevant and Appropriate	Relevant and appropriate to the excavation of highly contaminated soil. Applicable if more than 1 acre will be disturbed or for any disturbance within 500 feet of the water's edge of a lake or stream. Requires development of measures to minimize the erosion of soil and discharge of soils and sediment to nearby waters.
NREPA, R 336.1372(8)(b) – Control of Fugitive Dust	Establishes common measures to mitigate the generation of fugitive dust during small construction work.	Relevant and Appropriate	Relevant and appropriate for remedial actions where contaminated soil may become airborne. Measures such as wetting of airborne soil during excavation activities are often effective at controlling dust.

MCL = Michigan Compiled Laws

USFWS = U.S. Fish and Wildlife Service